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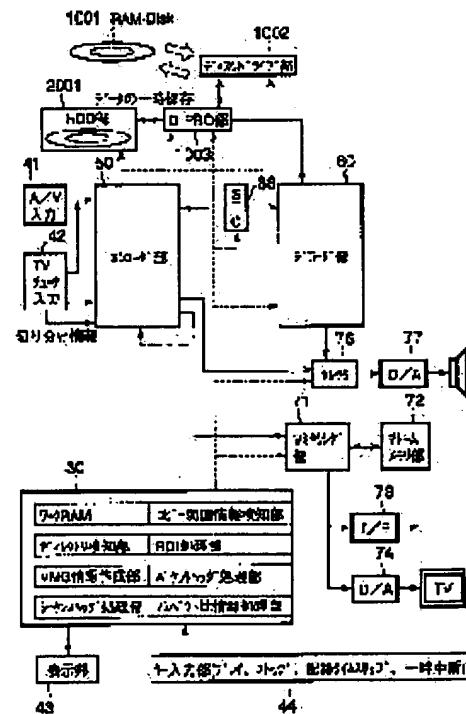
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(54) DEVICE AND METHOD FOR RECORDING AND REPRODUCING INFORMATION WITH MATCHING PROCESSING FUNCTION OF ASPECT RATIO INFORMATION

(57) Abstract:

PROBLEM TO BE SOLVED: To prevent the malfunction of equipment by obtaining a match between the content of aspect ratio information to be described in a prescribed area (RDI) regulated by a DVD format and the content of the aspect ratio information to be described in a prescribed area (sequence header) regulated by an MPEG-PES format with respect to the content of the aspect ratio information included in an inputted source.

SOLUTION: The aspect ratio information of an inputted video signal is detected and rewritten so as to obtain a match between the content of the aspect ratio information, the content of the aspect ratio information of the RDI positioned at the head of a video object unit



(VOBU) and the content of the aspect ratio control information of the sequence header of compressed video data within the VOBU to which the RDI belongs.

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CLAIMS

[Claim(s)]

[Claim 1] Two or more video packs with which the compression video data which has a sequence header including aspect ratio information (1st aspect ratio information) as a unit of an information settlement was distributed and stored, and the packet header attached to each, The audio information which compressed audio data, and the audio pack which includes audio scrambling information in the packet, The unit control information pack as management information including aspect ratio information (2nd aspect ratio information) (RDI), The video object unit which said unit control information pack (RDI) is located in a head, and contains the plurality of said video pack and said audio pack (VOBU), In the information rec/play equipment which defines the video object (VOB) containing one or more of this video object unit The video decoder which generates said video pack from the input source, and the audio decoder which generates said audio pack from said input source, It faces building the formatter which generates said video object unit, and said video object unit. The aspect ratio information (3rd aspect ratio information) included in said input source is detected. While setting said 2nd aspect ratio information in said unit control information pack to the contents which answered the contents of said 3rd detected aspect ratio information Said contents of the 1st aspect ratio information accompanying all the video packs in the video object unit which has said said 2nd set aspect ratio information at the head, respectively Rec/play equipment with an adjustment processing facility of the aspect ratio information characterized by providing the control means set to the contents which answered the contents of said 3rd detected aspect ratio information.

[Claim 2] The compression video data which has said sequence header is rec/play equipment with an adjustment processing facility of the aspect ratio information according to claim 1 characterized by being data compressed by the MPEG method.

[Claim 3] Two or more video packs with which the compression video data which has a sequence header including aspect ratio information (1st aspect ratio information) as a unit of an information settlement was distributed and stored, and the packet header attached to each, The audio information which compressed audio data, and the audio pack which includes audio scrambling information in the packet, The unit control information pack as management information including

aspect ratio information (2nd aspect ratio information) (RDI), The video object unit which said unit control information pack (RDI) is located in a head, and contains the plurality of said video pack and said audio pack (VOBU), In the information rec/play approach of defining the video object (VOB) containing one or more of this video object unit The step which generates said video pack from the input source, and the step which generates said audio pack from said input source, It faces building the step which generates said video object unit, and said video object unit. The aspect ratio information (3rd aspect ratio information) included in said input source is detected. While setting said 2nd aspect ratio information in said unit control information pack to the contents which answered the contents of said 3rd detected aspect ratio information Said contents of the 1st aspect ratio information accompanying all the video packs in the video object unit which has said said 2nd set aspect ratio information at the head, respectively The rec/play approach with an adjustment processing facility of the aspect ratio information characterized by providing the step set to the contents which answered the contents of said 3rd detected aspect ratio information.

[Claim 4] Two or more video packs with which the compression video data which has a sequence header including aspect ratio information (1st aspect ratio information) as a unit of an information settlement was distributed and stored, and the packet header attached to each, The audio information which compressed audio data, and the audio pack which includes audio scrambling information in the packet, The unit control information pack as management information including aspect ratio information (2nd aspect ratio information) (RDI), The video object unit which said unit control information pack (RDI) is located in a head, and contains the plurality of said video pack and said audio pack (VOBU), In the information rec/play approach of defining the video object (VOB) containing one or more of this video object unit The information rec/play approach characterized by setting up the aspect ratio of the encoding output of the video data in the video object to which the sequence header concerned belongs only with reference to the aspect ratio information included in said sequence header.

[Claim 5] Two or more video packs with which the compression video data which has a sequence header including aspect ratio information (1st aspect ratio information) as a unit of an information settlement was distributed and stored, and the packet header attached to each, The audio information which compressed audio data, and the audio pack which includes audio scrambling information in the packet, The unit control information pack as management information including aspect ratio information (2nd aspect ratio information) (RDI), The video object unit which said unit control information pack (RDI) is located in a head, and contains the plurality of said video pack and said audio pack (VOBU), In the information rec/play equipment which defines the video object (VOB) containing one or more of this video object unit The video decoder which generates said video pack from the input source, and the audio decoder which generates said audio pack from said input source, It faces building the formatter which generates said video object unit, and said video object unit. The aspect ratio information (3rd aspect ratio information) included in said input source is detected. While setting said 2nd aspect ratio information in said unit control information pack to the

contents which answered the contents of said 3rd detected aspect ratio information Said contents of the 1st aspect ratio information accompanying all the video packs in the video object unit which has said said 2nd set aspect ratio information at the head, respectively The 1st control means set to the contents which answered the contents of said 3rd detected aspect ratio information, The video object management means for managing said video object which carried out two or more sets of said video object unit, While it faces that said video object management means creates object management information and each aspect ratio information on said two or more unit control information packs shows 4:3 or 16:9 So that it may become the contents which answered the contents of the aspect ratio information on the contents judged with a judgment means to judge much any there are, and said judgment means to be more ones Rec/play equipment with a limit information adjustment processing facility characterized by having the 2nd control means which sets the aspect ratio information within said object management information.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] This invention relates to the rec/play equipment with an adjustment processing facility of limit information with which it is between a settlement of the small unit of a data unit, and a settlement of the big unit containing this, and adjustment was acquired for example, about aspect ratio information.

[0002] As rec/play equipment with which this invention is applied, there is a device which can deal with media, such as DVD (digital versatile disc), for example. Moreover, there is a device which contained a hard disk or mass semiconductor memory. Moreover, there is a device which can deal with media, such as a hard disk and removable DVD, to coincidence.

[0003]

[Description of the Prior Art] In recent years, while using current and the international-standard-ized MPEG 2 (Moving Image Coding Expert Group) method in image compression technology, DVD specification which adopted AC3 audio compression method was proposed.

[0004] According to an MPEG 2 system layer, this specification supports an MPEG 2 method to an animation compression method, and is supporting AC3 audio compression method and the MPEG audio compression method to the speech compression method. Furthermore, the subimage data which carried out run length compression of the bit map data as objects for titles, such as a movie and karaoke, can be dealt with now. Furthermore, CDC for special playback (Navi-pack), such as rapid-traverse backward feed, is added, and it is constituted from relation with a regenerative apparatus by this specification. By this specification, the specification of IS09660 and Micro UDF is supported further again so that disc data can be read by computer.

[0005] Moreover, as own specification of media, following the specification of DVD-ROM which is the media of DVD-video, the specification (storage capacity of about 4.7GB) of DVD-RAM is also completed, and a DVD-RAM drive is also beginning to spread as computer-related peripherals.

[0006] Furthermore, a verification activity is also due to use DVD-RAM now, and for the DVD video specification, i.e., the specification of RTR(Real Time Recording)-DVD, of realizing the system in which information record playback on

real time is possible to be completed, and to be ended in the near future. This specification is considered based on the specification of the DVD-video by which current sale is carried out. Furthermore, the file system corresponding to the RTR-DVD is also standardized now.

[0007] On the other hand, the hard disk equipment (HDD) built in rec/play equipment is used, and the method which carries out record playback of the broadcast signal is also considered. In a hard disk drive unit, 100 G bytes or more of data logging is possible.

[0008]

[Problem(s) to be Solved by the Invention] The rec/play equipment which used the broadcast signal etc. effectively as an object for a real-time image transcription is developed in information storage media (DVD, a hard disk, semiconductor memory) with development of image compression technology as mentioned above.

[0009] Here, when the use gestalt of this device is considered, the following use gestalten can be considered. That is, it is inputted into rec/play equipment, and a program signal (or regenerative signal from other media) changes a program signal into a predetermined format, and records rec/play equipment on a record medium. Such record processing is carried out to intermittent program reservation time amount. Moreover, two or more programs are once recorded on a built-in record medium. And it is and editing by deleting a part etc. [that the recorded program combines]

[0010] When such a use gestalt is considered, the program from which an aspect ratio differs depending on a program may be arranged.

[0011] However, how the mutual relation of the aspect ratio information specified in a format of DVD-RAM and the aspect ratio information specified in an MPEG format is dealt with has not specified concretely the device which uses DVD-RAM. For this reason, even if aspect ratio information exists in the management information (RDI pack as navigation) added per video object unit specified in a DVD-RAM format, it may differ from the aspect ratio information in that video sequence header. If there is such conflict, when performing video regeneration, the judgment result of an aspect ratio may not become settled and may malfunction. Moreover, while a different aspect ratio had been set up, it may operate.

[0012] Then, adjustment is acquired by the contents of the aspect ratio information described by the contents of the aspect ratio information described by the predetermined area (RDI) specified in a DVD format, and the predetermined area (sequence header) which has specified in a MPEG_PES format to the contents of the aspect ratio information included in the input source, and this invention aims at offering the rec/play equipment with an aspect information adjustment processing facility which can prevent malfunction of a device.

[0013]

[Means for Solving the Problem] The video pack whose invention of this includes the video information which compressed the video data, and video scramble control information as a unit of an information settlement, An audio pack including the audio information which compressed audio data, and audio scrambling

information, The unit control information pack as management information including copy control information (CCI) (RDI), The video object unit which said unit control information pack is located in a head, and contains one or more of said video pack, and one or more of said audio pack (VOBU), It is applied to the information rec/play equipment and the approach of defining the video object (VOB) containing one or more of this video object unit.

[0014] The video decoder to which this invention generates said video pack from the input source, The audio decoder which generates said audio pack from said input source, It detects the formatter which generates said video object unit, and that copy related information is contained in said input source. Said copy control information, all the video packs in a video object unit including this copy control information -- and -- or it has the control means which sets contents with said scrambling control information accompanying an audio pack to the contents which answered the contents of said detected copy related information, respectively.

[0015] Since the aspect ratio information set as RDI and the aspect ratio information on the sequence header of the video data in corresponding VOB have consistency by this, it is lost that a regeneration function malfunctions.

[0016]

[Embodiment of the Invention] The gestalt of implementation of this invention is explained with reference to a drawing below.

[0017] Drawing 1 is drawing showing the gestalt of 1 operation of the rec/play equipment which applied this invention. Although this example is shown as a record medium as rec/play equipment which can deal with both DVD-RAM and a hard disk, this invention is applicable also to the equipment which deals with one of record media. Moreover, a hard disk or DVD-RAM may be permuted by the storage by semiconductor memory.

[0018] If each block of drawing 1 is roughly divided, the main blocks of the Records Department are shown in left-hand side, and the main blocks of the playback section are shown in right-hand side.

[0019] This information rec/play equipment has the data-processor section 1003 which receives the signal which could supply record data to the hard disk drive section 2001, the disk drive section 1002 which carries out the rotation drive of the optical disk 1001 which is the information storage which can build a video file, and performs informational R/W, and the hard disk drive section 2001 and the disk drive section 1002, and was reproduced. The data-processor section 1003 deals with the data of record or a playback unit, and contains a buffer circuit, a modulation and a demodulator circuit, the error correction section, etc.

[0020] Moreover, this rec/play equipment is using as the main component the microcomputer block 30 which controls the encoder section 50 which constitutes an image transcription side, the decoder section 60 which constitutes a playback side, and actuation of the body of equipment.

[0021] The encoder section 50 has the analog-digital converter, video encoder, and audio encoder the object for videos which digitizes the inputted analog video signal and the inputted analog audio signal, and for audios. A subimage encoder is also included further again. Moreover, it has the formatter which carries out the output of each encoder to a format of predetermined DVD-RAM, and buffer

memory. The external analog video signal, the external analog audio signal, or the analog video signal and analog sound signal from the TV (television) tuner 42 from AV input section 41 are inputted into the encoder section 50.

[0022] In addition, the encoder section 50 supplies the digital video signal and the digital audio signal to the direct formatter, when a direct digital video signal and a digital audio signal are inputted. Moreover, each video data and audio data can be supplied to the video mixing section and the audio selector which are mentioned later.

[0023] A digital video signal is changed into the digital video signal compressed with the Variable Bit Rate based on MPEG 2 or MPEG1 specification in a video decoder. A digital audio signal is changed into the digital audio signal compressed with the fixed bit rate, or the digital audio signal of Linear PCM based on MPEG or AC-3 specification.

[0024] When subimage information is inputted from AV input section 42 (for example, signal from the DVD video playr with an independent output terminal of a subvideo signal), or when the DVD video signal of such a data configuration is broadcast and it is received by the TV tuner 42, the subvideo signal in a DVD video signal is encoded with a subimage encoder (run length compression), and serves as a bit map of a subimage.

[0025] It is pack-ized in a formatter, and becomes a video pack, an audio pack, and a subimagery pack, these gather further, and the encoded digital video signal, a digital audio signal, and subimage data are changed into the format specified by DVD-recording specification (for example, specification, such as DVD-RAM, DVD-R, and DVD-RW).

[0026] Here, this equipment can supply the information (packs, such as video, an audio, and subimage data) encoded in the encoder section 50, and the created management information to a hard disk drive unit 2001 through a data processor 1003, and can record it on a hard disk. Moreover, the information recorded on the hard disk is also recordable on an optical disk 1001 through the data-processor section 1003 and a disk drive 1002. The information currently recorded on the hard disk depends this on it being the same as the data format of an optical disk 1001.

[0027] The information encoded in the encoder section 50 and the created management information can also be directly recorded on an optical disk 1001 through the data-processor section 1003 and a disk drive 1002 further again. furthermore, it is recorded on an optical disk 1001 and a hard disk -- **** (a file or video object) -- it can also delete.

[0028] Moreover, and the object of a different program can be connected or edit processing can also be performed. [deleting a part of video object of No. two or more group currently recorded on the hard disk or the optical disk 1001] This is because the data unit (it mentions later) which the format concerning this invention deals with is defined and edit is made easy.

[0029] In addition, when the information currently recorded on the hard disk of the hard disk drive section 2001 differs from the data format of an optical disk 1001, the information read from the hard disk is encoded in the encoder section 50. And the encoded information is recordable on an optical disk 1001. Moreover,

the disk drive section 1002 has the roll control system to an optical disk 1001, a laser drive system, optical system, etc.

[0030] The microcomputer block 30 contains MPU (micro processing unit) or CPU (central processing unit), ROM in which the control program etc. was written, and RAM for offering a work area required for program execution.

[0031] MPU of the microcomputer block 30 performs defective location detection, non-record section detection, an image transcription information record location, UDF record, AV address selection, etc. according to the control program stored in the ROM, using RAM as a work area.

[0032] Moreover, the microcomputer block 30 has the information processing section required in order to control the whole system, and is equipped with a work piece RAM, the directory detection section, the VMG (whole video management information) information creation section, the copy related information detection section, a copy and the scrambling information processing section (RDI processing section), the packet header processing section, the sequence header processing section, and the aspect ratio information processing section.

[0033] The contents of which a user should be notified among the activation results of MPU are displayed on the display 43 of a DVD videocassette recorder, or it is indicated by OSD (onscreen display) at a monitor display. Moreover, it has the key input section 44 which gives the actuation signal for operating this equipment to the microcomputer block 30.

[0034] In addition, the microcomputer block 30 can perform timing which controls the disk drive section 1002, the data-processor section 1003, the encoder section 50, and/or decoder section 60 grade based on the time data from STC38. Although actuation of an image transcription or playback is usually performed synchronizing with the timer clock from STC38, the other processing may be performed to the timing which became independent in STC38.

[0035] The separator which the decoder section 60 separates each pack from the signal of the DVD format with pack structure, and is taken out, The memory used at the time of pack separation or other signal-processing activation, and V decoder which decodes the main image data (the contents of the video pack) separated with the separator, It has SP decoder which decodes the subimage data (the contents of the subimager pack) separated with the separator, and A decoder which decodes the audio data (the contents of the audio pack) separated with the separator. Moreover, the subimage data decoded by the decoded main image data were compounded suitably, and it has the video processor which outputs the subimage of a menu, a highlights carbon button, a title, or others to the main image in piles.

[0036] The output video signal of the decoder section 60 is inputted into the video mixer 71. Composition of text data is performed by the video mixer 71. Moreover, Rhine which is crowded direct picking in the signal from the TV tuner 41 or the A/V input section 42 is also connected to the video mixer 71. The frame memory 72 used as a buffer is connected to the video mixer 71. When the video mixer's 71 output is a digital output, it is outputted to the exterior through an interface (I/F) 73, and, in the case of analog output, is outputted to the exterior through a digital-analog converter 74.

[0037] Analogue conversion of the output audio signal of the decoder section 60 is carried out by the digital-analog converter 77 through a selector 76, and it is outputted outside. A selector 76 is controlled by the select signal from the microcomputer block 30. Thereby, a selector 76 can also choose directly the signal which carried out through [of the encoder section 50], when carrying out the direct monitor of the digital signal from the TV tuner 41 or the A/V input section 42.

[0038] In addition, in the formatter of the encoder section 50, each carving information is created during an image transcription, and it sends to MPU of the microcomputer block 30 periodically (information at the time of GOP head interruption etc.). As carving information, they are the number of packs of VOBU, I picture from a VOBU head and the address, the playback time amount of VOBU, etc.

[0039] To coincidence, delivery and MPU create VOB stream information (STI) for the information from the aspect information processing section to MPU at the time of image transcription initiation. STI saves resolution data, aspect data, etc. and each decoder section has initial setting performed here based on this information at the time of playback.

[0040] Moreover, in Rec/play DVD, the video file is taken as one file at one disk.

[0041] Here, in the real-time rec/play machine using DVD, in order that the point which should be careful of may continue playback without being disrupted while [it] having accessed (seeking) when accessing data, the sector which continues at worst is needed. This unit is called CDA (Conti GYUASU data area). That is, in order to realize seamless playback, it is the data size fixed beforehand.

[0042] It is more advantageous for this CDA to serve as an ECC (error correction code) block unit. Therefore, CDA size is made into the multiple of 16 sectors, and is recording in this CDA unit in the file system. The data-processor section 1003 supplies the data of reception and a CDA unit for the data of a VOBU unit to the disk drive section 1002 from the formatter of the encoder section 50. Moreover, if MPU of the microcomputer block 30 creates management information required to reproduce the recorded data and the command of data-logging termination is recognized, it will send the created management information to the data-processing section 1003. Thereby, management information is recorded on a disk. Therefore, when encoding is performed, MPU of the microcomputer block 30 receives the information on a data unit (carving information etc.) from the encoder section 50. Moreover, MPU of the microcomputer block 30 has recognized the management information (file system) read in the disk at the time of a recording start, has recognized the non-recorded area of a disk, and has set the record area of data as a disk through the data-processor section 1003.

[0043] Here, the relation between the management information of real time DVD and the video object which is contents is explained briefly.

[0044] In drawing 2 , a video object (VOB) is explained first. VOB is called a VR_MOVIE.VRO file by the directory. A video file is a layered structure, one file consists of one or more VOB(s) (video object), one VOB consists of one or more VOBU(s) (video object unit), and one VOBU consists of two or more packs. As two or more packs, a RDI pack, V (video) pack, A (audio) pack, etc. exist. A

subimagery pack (SP pack) may exist.

[0045] A RDI pack is called a unit control information pack, a navigation information pack, or a real-time data-information pack (RDI_PCK). The information which shows the start time when the field of the beginning of VOB where this belongs is reproduced, the information which shows the time of record of the VOB concerned, manufacturer information (MNFI), etc. are included in this pack. Moreover, display control information (DCI) and copy control information (CCI) are included. Display control information shows aspect ratio information, subtitle mode information, and film camera mode information. Copy control information (CCI) includes copy authorization information (0 0) or copy prohibition (copy no authorization) information (1 1).

[0046] The video data was compressed by the method of MPEG 2, and V pack consists of a pack header, a packet header, and the video-data section. Audio data are processed by methods, such as linears AC [PCM, MPEG, or] 3, and A pack consists of a pack header, a packet header, and audio data division.

[0047] Management information is called a video manager (VMG) and the program chain (PGC) which manages data playback sequence in it is defined. A cel (Cell) is defined as this program chain (PGC), and the video object information (VOBI) which is the information on a video object (VOB) used as the object which should be reproduced is further defined as a cel (Cell). The part which has recorded the concrete information on PGC is a program chain information (PGCI) part. Two kinds exist in PGCI, one is original PGCI (ORG_PGCI) and another is a you ZADI find PGC table (UD_PGCIT).

[0048] In VOBI, the time map (TMAP) is described and this TMAP can specify VOB which constitutes VOB corresponding to VOBI. The link from a cel to VOBI is pinpointed with the logical address. Moreover, the link from TMAP information to VOB and VOB is performed based on the stream number of VOB, the number of VOB(s) in this VOB, the entry number to each VOB, and the logical address to each target VOB.

[0049] Drawing 3 (A) shows the DS of the real-time information (RDI) included in the above-mentioned real-time data-information pack (RDI_PCK). RDI includes RDI general information (RDI_GI), display control information and copy control information (DCI_CCI), and manufacturer information (MNFI) like drawing 3 (B). RDI_GI contains the presentation start time (VOBU_S_PTM) of the video field of the beginning of VOB where this RDI belongs, and VOB chart lasting time (VOBU_REC_T). Display control information (DCI) consists of aspect ratio information:4 bit, subtitle (title) information:2 bit, reservation:1 bit, and film camera mode:1 bit, as shown in drawing 3 (C).

[0050] It is 0001 at the time of 0000 and 16:9 at the time of the aspect ratio 4:3 of video. Moreover, when the source is a letter box, the video by which 0000 and the value except 0001 were used and encoded is 4:3. It is 10, when a title is located in an image and it is located out of 01 and an image about title information. Film camera mode information is 0 at the time of 1 and film mode at the time of camera mode.

[0051] As the above-mentioned copy control information CCI is shown in drawing 3 (D), 2 bits of copy generation-control system (CGMS) information are included.

When this information is 00, it is shown that it is the ban (un-granting a permission) on a copy at copy authorization and the time of 11.

[0052] The contents of the packet header contained in each of a video pack, an audio pack, and a subimage pack are shown in drawing 4. A pack has a pack header. A system clock reference is described by the pack header, and it is compared with the system clock in equipment, and is used as timing information dealt with per pack within equipment. A packet header exists after a pack header and then a video data, audio data, or subimage data exists.

[0053] The stream ID which is the identification information of a packet start code, a video stream, an audio stream, and a subimage stream is described by the packet header. Moreover, arrangement of PES (packet elementary stream) scrambling control information (it is shown fundamentally whether the scramble has started or not), copyright information, and the information that shows [original or] whether it copies is attained at the packet header. The presentation hour entry (time stamp) for outputting a playback output synchronously between related streams (video, an audio, subimage) further again is described.

[0054] Drawing 5 (A)- drawing 5 (D) is especially the DS of the copy generation-control system specified about the present broadcast signal, and it is shown in order to explain SGMS.

[0055] Usually, multiplex [of the data called VBID] may be carried out to the perpendicular blanking period (VBI) of the video signal broadcast.

[0056] This VBID is used as information which shows what kind of signal the video signal by which multiplex is carried out is. There is the following as a broadcast signal and information.

[0057] (a) Squeeze (or full mode signal) -> Signal which put the information on the image of 525 lines and an aspect ratio 16:9 on 525 lines and the standard TV signal format of an aspect ratio 4:3.

[0058] (b) Letter box signal of an aspect ratio 4:3 -> Signal of the wide image with which it is 525 lines and an aspect ratio 4:3, there is a non-picture area up and down, and a main-picture area exists in the center.

[0059] (c) 3D information -> Information, such as a signal format about a three-dimension three dimensional display.

[0060] (d) Pulldown information -> Information for identifying whether when changing the film for CM of EIZO of 24 coma, or 30 coma into a video signal, it is an image from the same coma.

[0061] (e) Search information -> One or more index information used as the mark of the location reproduced with VTR etc.

[0062] Multiplex [of the above-mentioned information] is carried out to the 20th line and the 283rd line. When 2 bits of the beginning of the WORD (4 bits) (called WORD 0) of the beginning of VBID are 00, the image or those without information of an aspect ratio 4:3 is meant, and as for the time of 10, those without a convention are meant especially at the letter box signal of an aspect ratio 4:3, and the time of 11 at the squeeze signal of the image of an aspect ratio 16:9, and the time of 01.

[0063] Therefore, if the first 2 bits of WORD 0 of above VBID are detected, the aspect ratio of a video signal is detectable.

[0064] However, when 4 bits (WORD 1) arranged by the degree of WORD 0 (2 bits) are 0 and 0, this VBDI means that this information is used as CGMS.

[0065] Hereafter, CGMS is explained. This CGMS is inserted in the 20th level period (refer to drawing 5 (A)) of the perpendicular blanking period of a television signal, and is 20-bit information (refer to drawing 5 (B)). The 1st of the beginning and the 2nd 2 bits are used as WORD 0, and the 3rd to 6th 4-bit WORD 1 as follows is 0000, and shows that copy generation control information exists in a degree. Furthermore, the 14th is defined as WORD 2 from the following 7th. The 20th is CRCC, i.e., an error condition, from the following 15th.

[0066] Here, the 7th and the 8th 2 bits are CGMS data, and is defined like drawing 5 (C). In the case of 0 and 0, it means that it can copy without a constraint, in the case of 1 and 0, ** which can be copied one generation is meant, and, in the case of 1 and 1, it means that it is the ban on a copy.

[0067] Therefore, in a recording apparatus side, when recording the video signal concerned on an archive medium with reference to this CGMS, correspondence as shown in drawing 5 (C) can be performed. Namely, when the 7th and the 8th contents of a bit are 0 and 0 (copy authorization information) The contents of CGMS shown in drawing 3 (D) are set to 0 and 0 (copy authorization information). Moreover, the 7th and the 8th contents of a bit set to 1 and 1 (copy prohibition information) the contents of CGMS in RDI which showed drawing 3 (D) in any case at the time of 1, 0 (only one generation copy authorization information), or 1 and 1 (copy prohibition information). Moreover, it unifies so that all the scrambling control information of each packet header in VOBU which has the RDI concerned at the head may also become the same contents as the contents of CGMS in the RDI concerned.

[0068] Furthermore, as explained previously, in a TV signal, 2 bits of data of WORD 0 are usually used as aspect ratio information on sent TV signal. And these 2 bits are defined as shown in drawing 5 (D). Namely, as for the signal of aspect ratio 3:4 image or information nothing, and 1 and 0, the squeeze signal of aspect ratio 16:9 image, and 0 and 1 are [0 and 0] the letter box signals of an aspect ratio 4:3. 1 and 1 do not use it.

[0069] Therefore, the rec/play equipment which processes the above-mentioned input television signal performs correspondence according to the contents shown in drawing 5 (D), when recording the video signal concerned on an archive medium with reference to this WORD 0. That is, aspect ratio information and the aspect ratio information included in DCI in RDI are set as the same contents. Furthermore, this RDI makes aspect ratio information in the sequence header of the compression video signal based on MPEG specification in VOBU arranged at the head the contents corresponding to the contents of the aspect ratio information in DCI.

[0070] The flow of operation for unification-izing aspect ratio information in RDI (referring to drawing 3 (C)) and aspect ratio information included in the sequence header of a compression video signal with reference to the aspect ratio information within the above-mentioned input TV signal is shown in drawing 6.

[0071] The program which described this procedure is set in the microcomputer block 30 shown in drawing 1. the data (CGMS) inserted in the specific level period

of a perpendicular blanking period from the television signal from the outside are incorporated -- it carries out (step B1). Next, the contents of the aspect ratio ream information that it explained by 8 are judged (step B-2, B3, B4, B5). And aspect ratio information is stored temporarily. Next, it is checked whether encoding processing progressed and the RDI pack has been generated by the formatter (step B6). If a RDI pack is checked (step B7), aspect ratio information on DCI in the RDI pack will be made into the contents which were adapted for the contents of the copy related information which was carrying out the temporary storage previously (step B8). These transformation rule are as having been shown in drawing 8 (C).

[0072] That is, fundamentally, since it is the signal of 4:3 when the judgment results of WORD 0 of the input source are 0 and 0, the aspect ratio information on RDI is set to 0, 0, 0, and 0, and since it is the signal of 16:9 when judgment results are 1 and 0, the aspect ratio information on RDI is set to 0, 0, 0, and 1. Moreover, at the time of 0 and 1, since a judgment result is the letter box signal of an aspect ratio 4:3, fundamentally, it sets the aspect ratio information on RDI to 0, 0, 0, and 0.

[0073] Furthermore, it unification-izes like the case of RDI also about the aspect ratio information in the sequence header which the video pack in VOBU containing this RDI has (step B9). This processing is performed about all the video packs in the VOBU concerned, and performs unification-ization with copy control information and scrambling control information until the following RDI pack is generated.

[0074] When the above-mentioned processing is performed, signs that formatting of the video information is carried out and it is arranged by the formatter in the encoder section 50 of drawing 1 are shown in drawing 7 with the passage of time. If more than one gather and a video pack (V_PCK) is seen in the form of an MPEG format, the data division of the video pack consist of a sequence header, a GOP header, I picture, B picture by which compression processing was carried out, etc.

[0075] It shall be processed so that the aspect ratio information on the sequence header of the compression video signal which the aspect ratio information on the RDI pack of the 1st head of VOBU#1 is 0 and 0, and is included in this VOBU#1 may also be now set to 0, 0, 0, and 0. While this VOBU#1 being processed, WORD 0 of the input video signal to the encoder section 50 presupposes that it changed to 1, 0, or 1 and 1. Then, the copy and the scrambling information processing section of this invention detect contents change of WORD 0. And when creating the following VOBU#2, the contents of CGMS in RDI arranged at the head are set to 0, 0, 0, and 1 (16:9). Moreover, it is processed so that the aspect ratio information on the sequence header after this may also be set to 0, 0, 0, and 1.

[0076] In addition, in the above-mentioned explanation, as fundamental processing, the aspect ratio information on RDI was set to 0, 0, 0, and 0 at the time of 0 and 0 (4:3 is shown), and the judgment result of WORD 0 of the input source presupposed that a judgment result sets the aspect ratio information on RDI to 0, 0, 0, and 1 at the time of 1 and 0 (16:9 is shown). However, you may make it set up still more finely by user setup which is carrying out the monitor. For example, either may be made to be set in the case of a letter box like 1000, 0100,

1101, 0010, 1011, and 0111.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the rec/play equipment with an adjustment processing facility of limit information with which it is between a settlement of the small unit of a data unit, and a settlement of the big unit containing this, and consistency was acquired for example, about aspect ratio information.

[0002] As rec/play equipment with which this invention is applied, there is a device which can deal with media, such as DVD (digital versatile disc), for example. Moreover, there is a device which contained a hard disk or mass semiconductor memory. Moreover, there is a device which can deal with media, such as a hard disk and removable DVD, simultaneously.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] In recent years, while using current and the international-standard-sized MPEG 2 (Moving Image Coding Expert Group) method in image compression technology, DVD specification which adopted AC3 audio compression method was proposed.

[0004] According to an MPEG 2 system layer, this specification supports an MPEG 2 method to an animation compression method, and is supporting AC3 audio compression method and the MPEG audio compression method to the speech compression method. Furthermore, the subimage data which carried out run length compression of the bit map data as objects for titles, such as a film and karaoke, can be dealt with now. Furthermore, CDC for special playback (Navi-pack), such as rapid-traverse backward feed, is added, and it is constituted from relation with a regenerative apparatus by this specification. By this specification, the specification of IS09660 and Micro UDF is supported further again so that disc data can be read by computer.

[0005] Moreover, as own specification of media, following the specification of DVD-ROM which is the media of DVD-video, the specification (storage capacity of about 4.7GB) of DVD-RAM is also completed, and a DVD-RAM drive is also beginning to spread as computer-related peripherals.

[0006] Furthermore, a verification activity is also due to use DVD-RAM now, and for the DVD video specification, i.e., the specification of RTR(Real Time Recording)-DVD, of realizing the system in which information record playback on real time is possible to be completed, and to be ended in the near future. This specification is considered based on the specification of the DVD-video by which current sale is carried out. Furthermore, the file system corresponding to the RTR-DVD is also standardized now.

[0007] On the other hand, the hard disk equipment (HDD) built in rec/play equipment is used, and the method which carries out record playback of the broadcast signal is also considered. In a hard disk drive unit, 100 G bytes or more of data logging is possible.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] As described above, consistency is acquired by the content of the aspect ratio information described by the content of the aspect ratio information described by the predetermined area (RDI) which has been specified in a DVD format to the content of the aspect ratio information included in the input source according to this invention, and the predetermined area (sequence header) specified in a MPEG_PES format, and malfunction of a device can be prevented.

[Translation done.]

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MEANS

[Means for Solving the Problem] The video pack whose invention of this includes the video information which compressed the video data, and video scramble control information as a unit of an information settlement, An audio pack including the audio information which compressed audio data, and audio scrambling information, The unit control information pack as management information including copy control information (CCI) (RDI), The video object unit which said unit control information pack is located in a head, and contains one or more of said video pack, and one or more of said audio pack (VOBU), It is applied to the information rec/play equipment and the approach of defining the video object (VOB) containing one or more of this video object unit.

[0014] The video decoder to which this invention generates said video pack from the input source, The audio decoder which generates said audio pack from said input source, It detects the formatter which generates said video object unit, and that copy related information is contained in said input source. Said copy control information, all the video packs in a video object unit including this copy control information -- and -- or it has the control means which sets a content with said scrambling control information accompanying an audio pack to the content which answered the content of said detected copy related information, respectively.

[0015] Since the aspect ratio information set as RDI and the aspect ratio information on the sequence header of the video data in corresponding VOB have consistency by this, it is lost that a regeneration function malfunctions.

[0016]

[Embodiment of the Invention] The gestalt of implementation of this invention is explained with reference to a drawing below.

[0017] Drawing 1 is drawing showing the gestalt of 1 operation of the rec/play equipment which applied this invention. Although this example is shown as a record medium as rec/play equipment which can deal with both DVD-RAM and a hard disk, this invention is applicable also to the equipment which deals with one of record media. Moreover, a hard disk or DVD-RAM may be permuted by the storage by semiconductor memory.

[0018] If each block of drawing 1 is roughly divided, the main blocks of the Records Department are shown in left-hand side, and the main blocks of the playback section are shown in right-hand side.

[0019] This information rec/play equipment has the data-processor section 1003

which receives the signal which could supply record data to the hard disk drive section 2001, the disk drive section 1002 which carries out revolution actuation of the optical disk 1001 which is the information storage which can build a video file, and performs informational R/W, and the hard disk drive section 2001 and the disk drive section 1002, and was reproduced. The data-processor section 1003 deals with the data of record or a playback unit, and contains a buffer circuit, a modulation and a demodulator circuit, the error correction section, etc.

[0020] Moreover, this rec/play equipment is using as the main component the microcomputer block 30 which controls the encoder section 50 which constitutes an image transcription side, the decoder section 60 which constitutes a playback side, and actuation of the body of equipment.

[0021] The encoder section 50 has the analog-digital converter, video encoder, and audio encoder the object for videos which digitizes the inputted analog video signal and the inputted analog audio signal, and for audios. A subimage encoder is also included further again. Moreover, it has the formatter which carries out the output of each encoder to a format of predetermined DVD-RAM, and buffer memory. The external analog video signal, the external analog audio signal, or the analog video signal and analog sound signal from the TV (television) tuner 42 from AV input section 41 are inputted into the encoder section 50.

[0022] In addition, the encoder section 50 supplies the digital video signal and the digital audio signal to the direct formatter, when a direct digital video signal and a digital audio signal are inputted. Moreover, each video data and audio data can be supplied to the video mixing section and the audio selector which are mentioned later.

[0023] A digital video signal is changed into the digital video signal compressed with the Variable Bit Rate based on MPEG 2 or MPEG1 specification in a video decoder. A digital audio signal is changed into the digital audio signal compressed with the fixed bit rate, or the digital audio signal of Linear PCM based on MPEG or AC-3 specification.

[0024] When subimage information is inputted from AV input section 42 (for example, signal from the DVD video playr with an independent output terminal of a subvideo signal), or when the DVD video signal of such a data configuration is broadcast and it is received by the TV tuner 42, the subvideo signal in a DVD video signal is encoded with a subimage encoder (run length compression), and serves as a bit map of a subimage.

[0025] It is pack-sized in a formatter, and becomes a video pack, an audio pack, and a subimagery pack, these gather further, and the encoded digital video signal, a digital audio signal, and subimage data are changed into the format specified by DVD-recording specification (for example, specification, such as DVD-RAM, DVD-R, and DVD-RW).

[0026] Here, this equipment can supply the information (packs, such as video, an audio, and subimage data) encoded in the encoder section 50, and the created management information to a hard disk drive unit 2001 through a data processor 1003, and can record it on a hard disk. Moreover, the information recorded on the hard disk is also recordable on an optical disk 1001 through the data-processor section 1003 and a disk drive 1002. The information currently recorded on the

hard disk depends this on it being the same as the data format of an optical disk 1001.

[0027] The information encoded in the encoder section 50 and the created management information can also be directly recorded on an optical disk 1001 through the data-processor section 1003 and a disk drive 1002 further again. furthermore, it is recorded on an optical disk 1001 and a hard disk -- **** (a file or video object) -- it can also delete.

[0028]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing showing the example of a configuration of the information rec/play equipment which applied this invention.

[Drawing 2] The explanatory view showing briefly the data format adopted with DVD-RAM.

[Drawing 3] The explanatory view showing the DS of the real-time recording information (RDI) arranged at the head of the video object unit adopted with DVD-RAM.

[Drawing 4] The explanatory view shown in order to explain the information on the packet header of the video packet defined by DVD specification, an audio packet, and a subimage packet.

[Drawing 5] The information explanatory view inserted in the vertical blanking period of a television signal.

[Drawing 6] The explanatory view showing the example of the procedure of the aspect ratio information by the equipment of this invention.

[Drawing 7] The explanatory view showing signs that rewriting processing of the aspect ratio information on a video object is carried out, with the passage of time with the procedure of the aspect ratio information shown in **drawing 6** .

[Drawing 8] The explanatory view shown in order to explain the directory structure in a DVD system.

[Drawing 9] The explanatory view in which showing a real-time recording manager's DS in DVD recording specification hierarchical, and showing especially the configuration of a video attribute.

[Drawing 10] The explanatory view showing the example of the 2nd procedure of the aspect ratio information by the equipment of this invention.

[Description of Notations]

30 -- microcomputer block and 41 -- the A/V input section, a 42 --TV tuner, 43 -- display, and 44 -- the key input section, 50 -- encoder section, 60 -- decoder section, and 71 -- a video mixer, 72 -- frame memory, 73 -- interface, 74, and 77 -- a digital-analog converter, 76 -- selector, a 1001 -- optical disk, and 1002 -- the disk drive section, the 1003 -- data-processor section, and a 2001 -- hard disk drive unit.

[Translation done.]

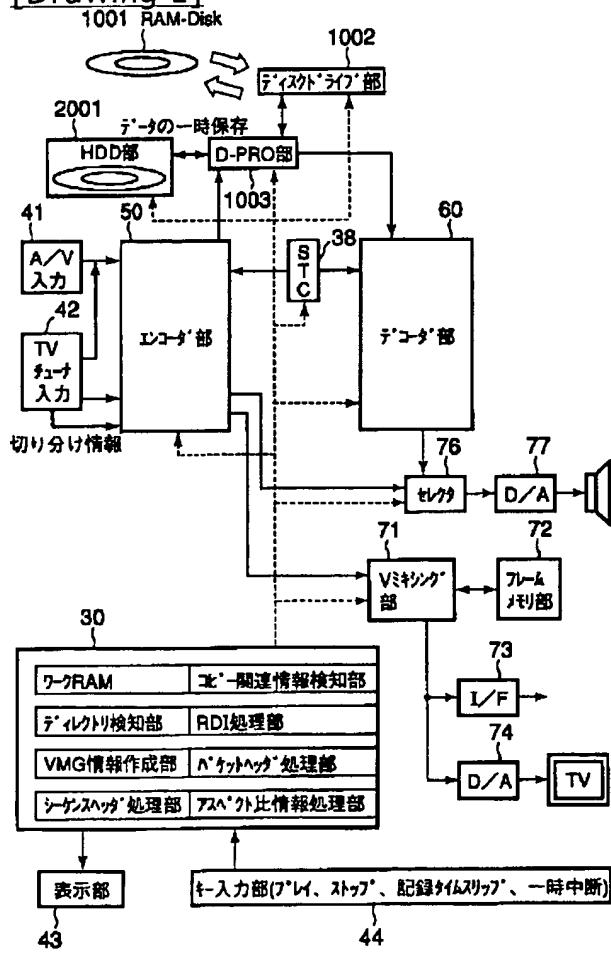
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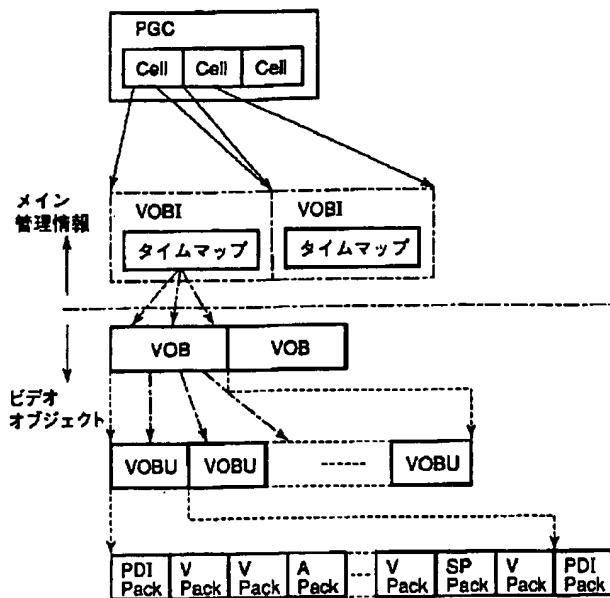
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DRAWINGS

[Drawing 1]



[Drawing 2]



[Drawing 3]

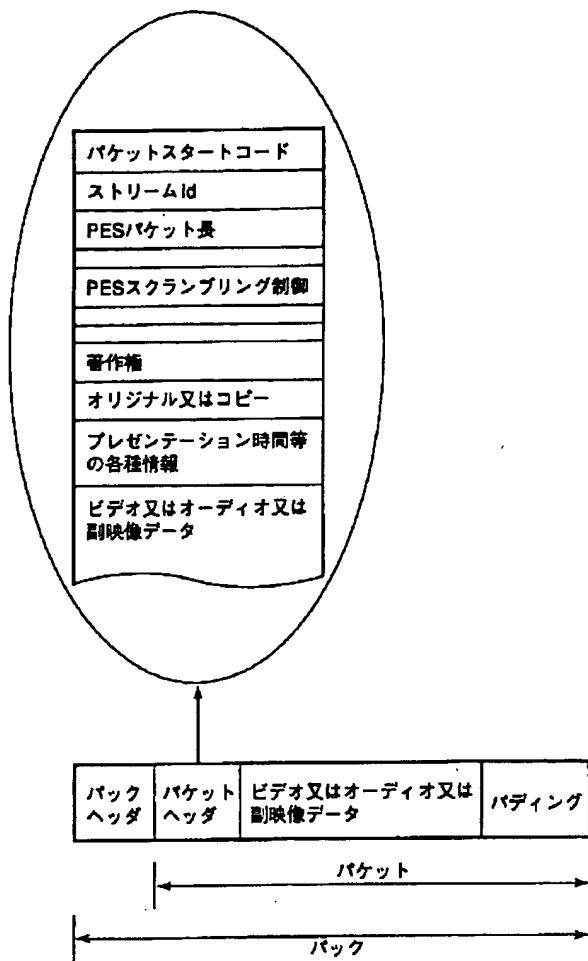
	RDI_GI	リアルタイムデータ情報一般情報
(A)	DCI_CCI	ディスプレイ制御情報とコピー制御情報
	MNFI	製造者情報

	予約	
(B)	VOBU_S_RTM	VOBUのプレゼンテーション開始時間
	予約	
	VOBU_REC_TM	VOBUの記録時間

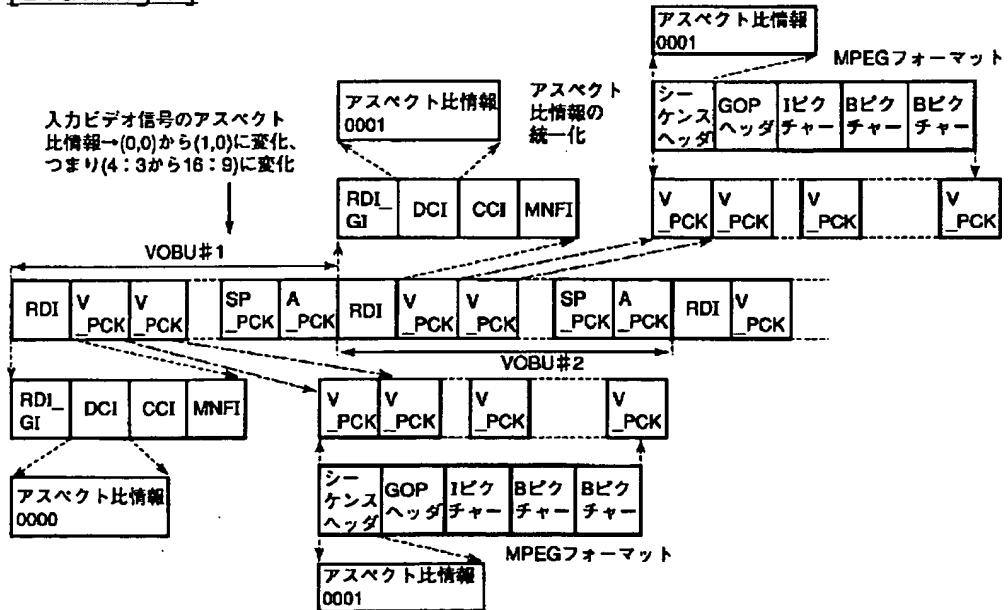
	DCI：ディスプレイ制御情報			
(C)	アスペクト比 4b	字幕モード 2b	予約 1b	フィルムカメラモード 1b

	CCI：コピー制御情報			
(D)	CGMS 2b	APSTB 2b	ソース 1b	予約 3b

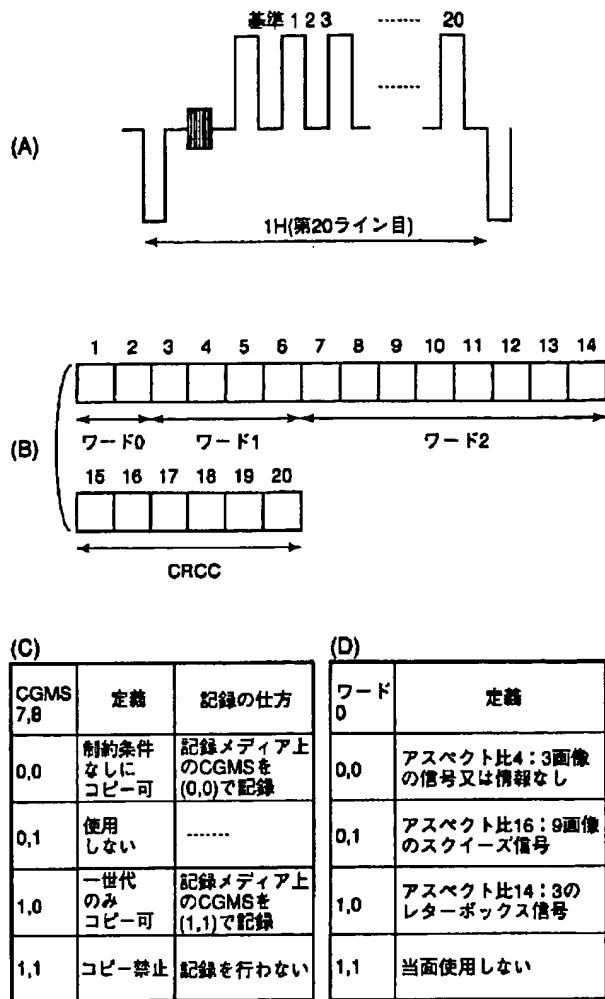
[Drawing 4]



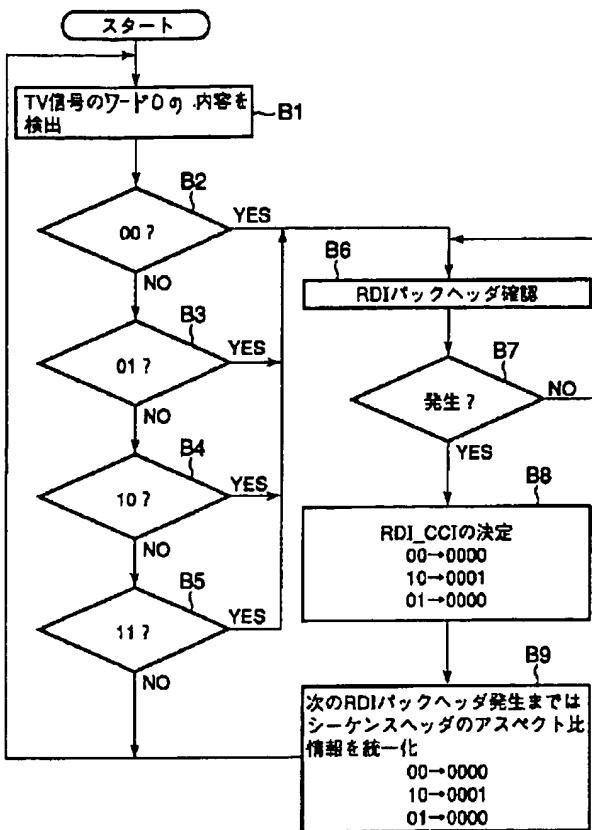
[Drawing 7]



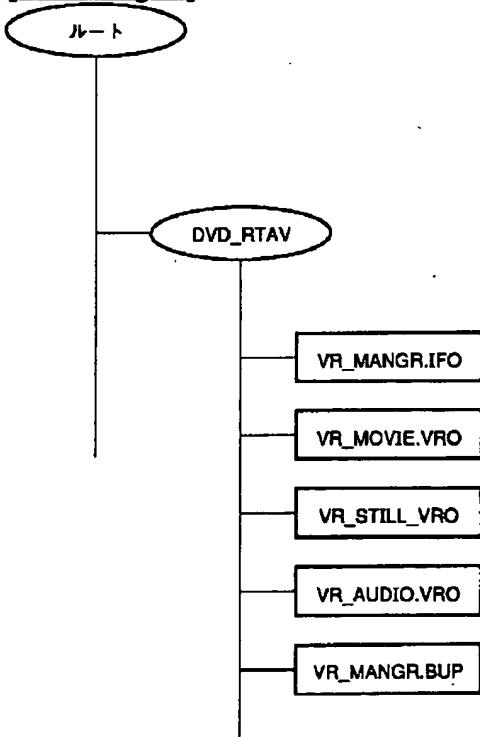
[Drawing 5]



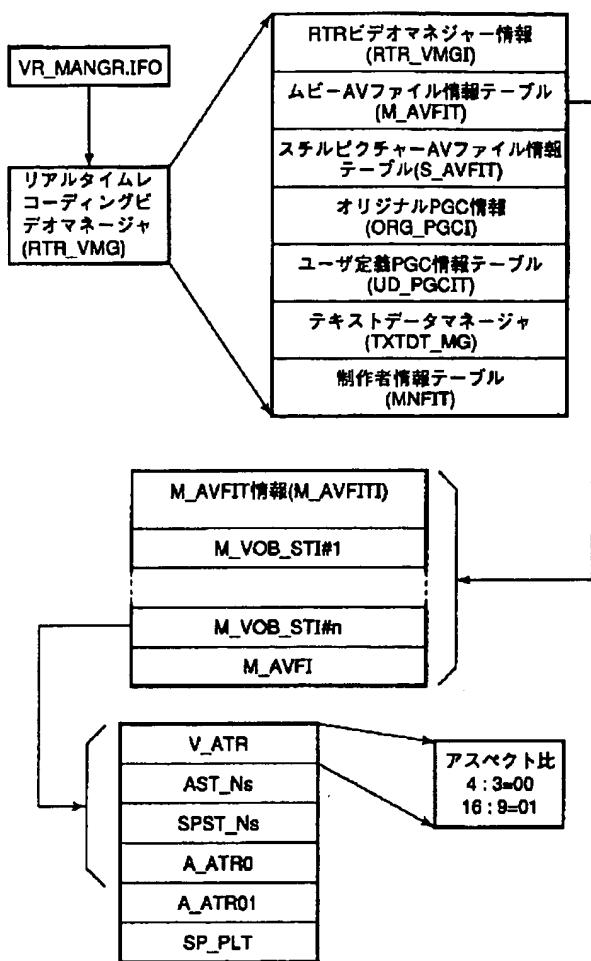
[Drawing 6]



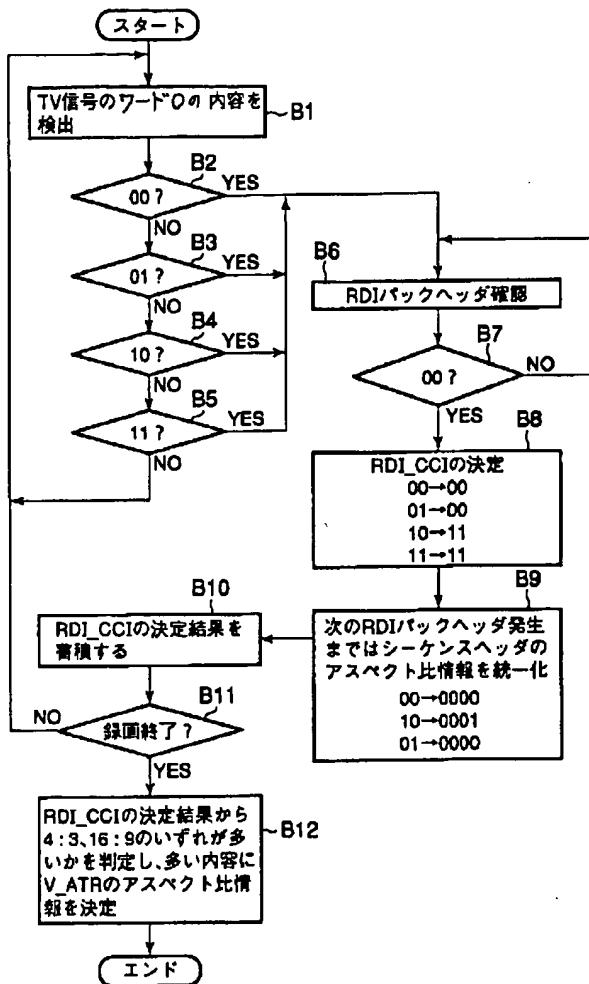
[Drawing 8]



[Drawing 9]



[Drawing 10]



[Translation done.]